Joint C4ISR Decision Support Center

DSC 02-1, ***Space Based Radar Utility Analysis*** Executive Summary

Background: The Joint C4ISR Decision Support Center (DSC) FY 2002 Study Task 1, *Space Based Radar (SBR) Utility Analysis*, was chartered by a USD(AT&L) Acquisition Decision Memorandum (ADM) signed 30 Nov 01:

> ...the DoD Joint C4ISR Decision Support Center, with support from USSPACECOM, NIMA, and the Joint Staff Director for Force Structure, Resources and Assessment, will conduct a study (completion 120 days from the date of this memorandum) to provide initial analysis of SBR military utility. Results from this study, incorporated with assessments of Intelligence Community utility, will be presented during the Milestone-A review and be used to guide system development and support the formal requirements, architecture, and analysis of alternatives process.

The study accomplishes several objectives:

- Provides analysis-based conclusion that SBR can provide ***persistent global situation awareness***
- Shows quantifiable utility of SBR for military operations, intelligence operations, and global mapping in peacetime, crisis, and war
- Obtains Service, Joint, and Intelligence Community (IC) perspectives on SBR
- Supports the formal requirements, architecture, and analysis of alternatives processes.

Study Methodology: The study focuses on the utility of SBR to find, track, and identify moving and fixed objects to support ***persistent global situation awareness*** in 2010 and beyond. Use of the term persistent global situation awareness vice persistent global surveillance is deliberate—ISR should ultimately provide understanding, not just coverage. The study pursues several diverse avenues of analytic inquiry and draws together common conclusions that quantify SBR utility across peacetime, crisis and war. Quantifiable study components include:

- Time-critical targeting (TCT) for joint suppression of enemy air defenses (JSEAD) and missile defense in a Southwest Asia (SWA) scenario.
- Major theater war (MTW), emphasizing precision engagement and dominant maneuver in SWA, Northeast Asia (NEA and RT-2), and Balkans scenarios
- Persistent global intelligence preparation of the battlespace (IPB) and indications and warning (I&W) during peacetime and crisis
- Maritime situation awareness (SA) in peacetime and crisis.
- SBR contributions to homeland security
- SBR support to transformation concepts such as Standing Joint Force

Some aspects of SBR are not easily quantified and are treated qualitatively.

A top down approach was taken to define performance estimates for SBR. We used an Aerospace CDC report (31 Jan 01) and extracted a high and low power LEO and a high and low

power MEO configuration. Full constellations were assumed. Cost and risk issues were not evaluated. Performance estimates were averaged for the MEO and LEO configurations to provide a range of performance for "SBR". We evaluated SBR in a context of a projected multi-INT ISR capability for 2010. Complete ISR connectivity was assumed together with the ability to dynamically retask as needed to respond to cross cues.

Extensive analytical work was performed to quantify the value added of SBR over a baseline configuration that included NTM and airborne capabilities projected for 2010. Results span peacetime, crisis and warfare situations. Many results are characterized in terms of situation awareness were no scenario exists. The study also evaluated a number of specific "value of SBR" for specific situations.

Summary Findings: The study arrived at several top-level conclusions:

- Major improvement in support to warfighter over baseline (no SBR)
  - Supports concepts like Standing Joint Force (SJF)
  - Assured IPB, I&W to support CINC engagements for peacetime, crisis, and war
  - Major improvement in JSEAD, deep precision engagement, and maneuver
  - Denies enemy sanctuary of time, mobility, and depth
- Major improvement in global information needs satisfaction over baseline
  - SAR and rapid revisit SAR capability can address a major part of the CINF Global Watch and critical node information needs
- SBR provides new transformational capability for ***persistent global situation awareness***
  - Anytime, anywhere, all weather (e.g., distributed geographic flexibility)
  - Worldwide "tripwire" situation awareness—new capability in peacetime or crisis
    - Near **100%** situation awareness possible
  - Significant homeland security contributions

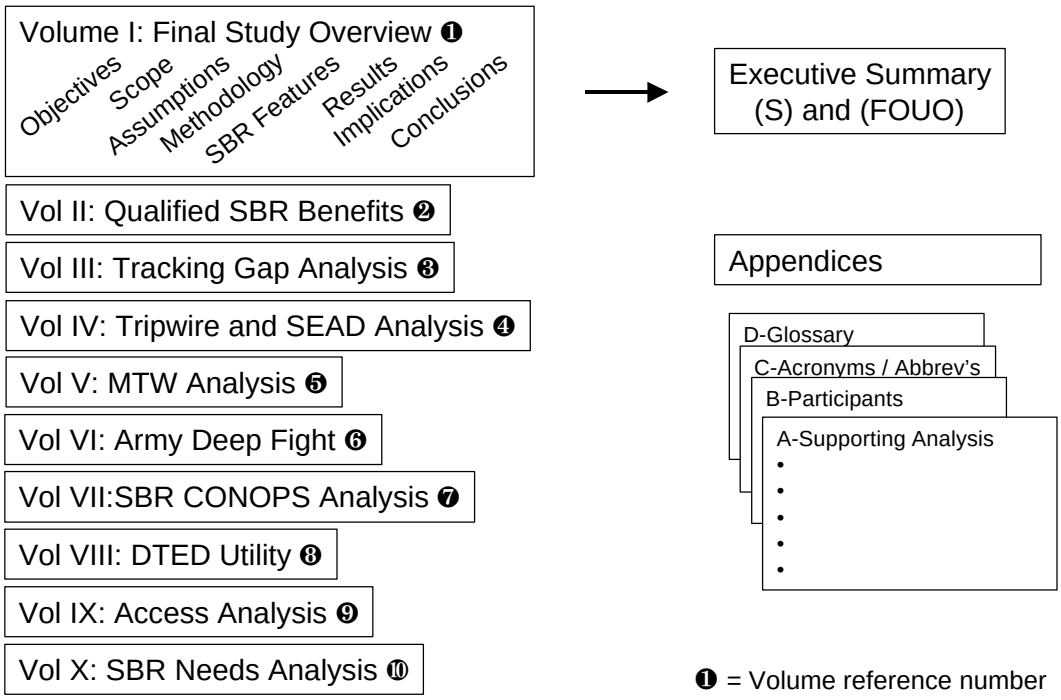
Study quantifies an overall conclusion that SBR is transformational.

Study results are contained in various forms that are available on the SECRET Internet Protocol Router Network (SIPRNET) and the Joint Worldwide Intelligence Communications System (JWICS):

http://www.dsc.osd.smil.mil/
http://www.c3i.ic.gov/

An executive summary and an overview summary gives the justification for study conclusions. Backup volumes provide complete technical background for detailed study results.

The complete report is in 10 volumes and several appendices as outlined by the following graphic.


Volume I: Final Study Overview ❶
Objectives
Scope
Assumptions
Methodology
SBR Features
Results
Implications
Conclusions
Executive Summary (S) and (FOUO)
Vol II: Qualified SBR Benefits ❷
Vol III: Tracking Gap Analysis ❸
Vol IV: Tripwire and SEAD Analysis ❹
Vol V: MTW Analysis ❺
Vol VI: Army Deep Fight ❻
Vol VII:SBR CONOPS Analysis ❼
Vol VIII: DTED Utility ❽
Vol IX: Access Analysis ❾
Vol X: SBR Needs Analysis ❿
Appendices
D-Glossary
C-Acronyms / Abbrev's
B-Participants
A-Supporting Analysis
❶ = Volume reference number